PATENT APPLICATION
DOCKET NO.27866/32960

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Patrick W. Gray	)	For: CHITINASE MATERIALS AND METHODS
Serial No.: 08/663,618	)	
Filed: June 14, 1996	)	Group Art Unit: 1652
	)	Examiner: R. Prouty

#19

REQUEST UNDER 37 C.F.R. §1.607 FOR DECLARATION OF INTERFERENCE WITH U.S. PATENT NO. 5,928,928 AND ACCOMPANYING *PRIMA FACIE* SHOWING OF PRIORITY OF INVENTION

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicant seeks the declaration of an interference between the above-identified patent application (hereinafter "the present application") and U.S. Letters Patent No. 5,928,928 (hereinafter "the '928 patent") which issued July 27, 1999 based on U.S. Patent Application Serial No. 08/486,839 filed June 7, 1995. A copy of the '928 patent is attached hereto as Exhibit A.

I. Presentation of Proposed Count A, Under 37 C.F.R. §1.607(a)(2)

Applicant proposes the following Count A for interference.

PROPOSED COUNT A

> An oligonucleotide comprising at least 20 nucleotides which is capable of specifically hybridizing to a nucleic acid consisting of a nucleotide base sequence which nucleotide base sequence is selected from the group consisting of human chitinase cDNA and nucleotide base sequences fully complementary to human chitinase cDNA.

Proposed Count A is substantially identical to claim 17 of the '928 patent. The only difference is that claim 17 recites specific sequence identifiers (SEQ ID NO: 3 and SEQ ID NO: 5) while proposed Count A recites "human chitinase cDNA." Both SEQ ID NOS: 3 and 5 of the '928 patent are human chitinase cDNAs. (See cols. 17-18 of the '928 patent.) The proposed count is in fact broader than claim 17 of the '928 patent, which is the broadest issued claim relating to polynucleotide subject matter.

II. Identification of the Application Claims Corresponding to Proposed Count A, Pursuant to 37 C.F.R. §1.607(a)(4)

All pending claims 1-18 and 32 of the present application (a list of which is attached hereto as Exhibit B) are believed to correspond to proposed Count A. The accompanying Amendment adds claim 32 to the present application, which is reproduced below:

> 32. A purified, isolated polynucleotide encoding human chitinase or a fragment thereof, selected from the group consisting of:
> (a) a double-stranded DNA comprising the protein coding portions of the sequence set out in SEQ ID NO: 1; and
> (b) DNA which hybridizes under stringent conditions to a non-coding strand of the DNA of (a).

Claim 32 of the present application corresponds substantially to proposed Count A, *i.e.*, is drawn to the "same patentable invention" as proposed Count A. The SEQ ID NO: 1 recited in claim 32 is a human chitinase cDNA that is almost identical to SEQ ID NO: 3 of the '928 patent; differences appear at nucleotide positions 76 and 758-766 of SEQ ID NO: 3.

Proposed Count A is directed to an oligonucleotide fragment at least 20 nucleotides in length which is capable of specifically hybridizing to human chitinase cDNA, while claim 32 of the present application is directed to DNA encoding human chitinase or a

fragment thereof which hybridizes under stringent conditions to SEQ ID NO: 1 of the present application, *i.e.*, human chitinase cDNA. Such fragments encompassed by claim 32 would be in the general range of 20 nucleotides or longer and would certainly encompass oligonucleotides of "at least 20 nucleotides" as recited in proposed Count A.

In addition to claim 32, claims 1-18 relating to polynucleotides encoding human chitinase are believed to correspond to proposed Count A. All claims 1-18 were included in the same group (Group I, drawn to "DNA, vectors, and host cells encoding human chitinase") in the restriction requirement issued July 7, 1997 in the present application (attached hereto as Exhibit C).

Claims relating to human chitinase polypeptides, and to antibodies or hybridomas were considered to be directed to patentably distinct groups of inventions in the restriction requirement issued July 7, 1997.

III. Identification of '928 Patent Claims Corresponding to Proposed Count A, Pursuant to 37 C.F.R. §1.607(a)(3)

Claims 2, 15-17 and 21-22 of the '928 patent correspond to proposed Count A. All of these claims relate to the human chitinase cDNAs of SEQ ID NO: 3 or 5 of the '928 patent. SEQ ID NO: 3 of the '928 patent is predicted to encode an approximately 50 kD (445 amino acid) protein. SEQ ID NO: 5 of the '928 patent is predicted to encode an approximately 39 kD (366 amino acid) protein that contains the same N-terminal 363 amino acids as the 50 kD protein but differs in its three C-terminal amino acids. See col. 18, lines 5-22 of the '928 patent.

Claims 2, 15-17 and 21-22 address the same patentable invention as (*i.e.*, are not patentably distinct from) proposed Count A. As noted above, claim 17 is substantially

identical to proposed count A. Claims 15-16 (directed to nucleotide sequences comprising SEQ ID NO: 3 or 5) are encompassed within the scope of claim 17 and proposed Count A. Claims 21 and 22, directed to diagnostic kits, are dependent upon claims 17 and 15. Finally, claim 2 is clearly related to use of SEQ ID NO: 3 or 5 to produce recombinant human chitinase, and is directed to a chitinase produced by a genetically engineered host cell wherein the chitinase is encoded by SEQ ID NO: 3 or 5.

In contrast, claims 1 and 3-14 of the '928 patent, which solely address isolated chitinase proteins and compositions thereof, are believed to be patentably distinct from proposed Count A. The Patent Office appears to have agreed with this view in the restriction requirements issued in both the present application (on July 7, 1997; Exhibit C) and in the application that matured into '928 patent (on September 16, 1996; attached hereto as Exhibit D).[1] Both restriction requirements separated polynucleotides and polypeptides into independent and distinct groups of claims.

Furthermore, the Court of Appeals for the Federal Circuit has held that the human cDNA encoding a human protein is not *per se* obvious from the isolated protein, even when the complete amino acid sequence of the protein is known. *See, e.g., In re Bell,* 26 USPQ2d 1529, 991 F.2d 781 (Fed. Cir. 1993); *In re Deuel,* 34 USPQ2d 1210, 51 F.3d 1552 (Fed. Cir. 1995). *See also Fiddes v. Baird,* 30 USPQ2d 1481 (BPAI 1994). One of ordinary skill in the art would not have reasonably expected that isolation of human chitinase protein would put one immediately and directly in possession of human chitinase cDNA. The N-

[1]Group I (original polypeptide claims 1-14) was considered separate from group IV (original nucleic acid claims 19-21 and 28-29). In the response filed October 21, 1996 in the '928 patent file history (Exhibit E hereto), Applicant Aerts' arguments focused on the lack of undue burden in searching both polynucleotide and protein groups.

terminal sequence of human chitinase is highly homologous to other human non-chitinase glycoproteins. See Renkema et al., *J. Biol. Chem.*, 2198-2202 (1995), an article co-authored by the '928 patent inventor Aerts (attached hereto as Exhibit F). Any one of a set of degenerate probes encoding human chitinase amino acid sequence could cross-hybridize to polynucleotides encoding homologous non-chitinase proteins.

Claims 18-20 of the '928 patent, which address antibodies that specifically bind to human chitinase and kits comprising such antibodies, are also believed to be patentably distinct from proposed Count A because the nucleotide sequence of polynucleotides encoding human chitinase would not be obvious from the existence of antibodies to the protein.

Finally, claim 24, a method of decomposing chitin, is believed to be patentably distinct from proposed Count A because, in light of the fact that many mammalian members of the chitinase family are not chitinolytic (see, *e.g.*, Hakala et al., *J. Biol. Chem.*, *268*:25803-25810 (1993), attached hereto as Exhibit G), it would not be obvious that a new member of the chitinase family would have chitinase activity until it was tested.

IV. Application of the Terms of Applicant's New Claim 32 to the Disclosure, Pursuant to 37 C.F.R. §1.607(a)(5)

Applicant's original claim 13 addressed DNA encoding human chitinase including DNA that would hybridize to SEQ ID NO: 1 under stringent conditions. The only difference from claim 13 is the deletion of reference to redundancy of the genetic code and the addition of the language "or a fragment thereof", which finds support throughout the specification, *e.g.*, at page 3, lines 10-12 (which describes purified and isolated polynucleotides "encoding human chitinase or fragments and analogs thereof").

V. Applicant's *Prima Facie* Showing of Priority

Applicant is *prima facie* entitled to priority and judgment in view of the accompanying declarations pursuant to 37 C.F.R. §1.608(b) by inventor Dr. Patrick W. Gray and Heather Brammer (attached hereto as Exhibits H and I, respectively). All exhibits attached to the Declarations are authenticated as copies of documents generated and maintained in the ordinary course of business by the Assignee of the present application, ICOS Corporation.

These declarations by the inventor and a corroborating witness set out a factual description of acts and circumstances performed or observed by the declarants, as supported by documentary evidence including notebook records, sequence data and homology comparison results, which collectively would *prima facie* entitle the Applicant to judgment on priority with respect to the June 7, 1995 filing date of the '928 Patent.

Inventor Dr. Gray's Declaration establishes that, prior to June 7, 1995, he conceived of and reduced to practice in the United States subject matter encompassed by proposed count A and claim 32 of the present application. Laboratory work relevant to the reduction to practice was performed under Dr. Gray's direction by Heather Brammer, who provided a corroborating declaration.

As described in Example 1 of the application, the plasmid designated MO-911 was identified and characterized as containing a fragment of the coding region for a human chitinase homolog. The documents attached to Heather Brammer's Declaration (Exhibit I) as Exhibits 1, 2 and 3 demonstrate that, prior to the June 7, 1995 filing date of U.S. Patent No. 5,928,928, the cDNA insert of plasmid MO-911 had been partially sequenced and character-

ized as a chitinase by comparison with other known sequences in nucleotide and peptide sequence databases. See paragraph 11 of the Declaration.

The document attached to Dr. Gray's Declaration (Exhibit H) as Exhibit 1, which is an alignment of the DNA sequence of clone MO911 with the human chitinase DNA sequence set forth in SEQ ID NO: 3 in the '928 patent, shows that the two sequences are nearly identical and demonstrates that the cDNA insert of MO911 would specifically hybridize to SEQ ID NO: 3 under appropriate hybridization conditions.[2] See paragraph 6 of the Declaration.

Thus, the declaratory evidence shows that a fragment of DNA encoding human chitinase which would specifically hybridize to human chitinase cDNA (either SEQ ID NO: 3 of the '928 patent or SEQ ID NO: 1 of the present application), which is subject matter encompassed by both claim 32 and proposed Count A, was reduced to practice before the June 7, 1995 filing date of the '928 patent.

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[2]For completeness of the record, Exhibit 1 to Dr. Gray's Declaration also displays the cDNA sequence of Figure 1 of the '928 patent, which should be identical to SEQ ID NO: 3 (see col. 10, lines 22-24) but is not. The cDNA sequence of SEQ ID NO: 3 differs from Figure 1 at nucleotide position 76.

VI. CONCLUSION

The facts establish that Applicant has made a *prima facie* showing of entitlement to judgment against the patentees of the '928 patent on grounds of priority. Applicants respectfully request that an interference be promptly declared involving the present application and the '928 patent.

Respectfully submitted,

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